AI: Evolution, Understanding, Application, and Programming

Module 1: Introduction to Artificial Intelligence

- Overview and Q&A session (1h30)
- Definition and evolution of AI:
  - Terminology and evolution
  - From early algorithms to neural networks
  - Deep Learning and Generative AI
  - Weak, General, and Superintelligent AI
  - Examples of applications across sectors
- Factors supporting AI:
  - Algorithmic and heuristic structures
  - Hardware aspects (CPU, GPU, TPU)
  - Languages (R, Python, C++, Rust, Mojo)
  - Software and frameworks
- Introduction to Machine Learning:
  - Main model categories
  - Supervised and unsupervised learning
  - Applications and use cases
- Introduction to Deep Learning:
  - Differences from Machine Learning
  - Concepts and models
  - Applications and use cases
- Natural Language Processing features
- Overview of Generative AI:
  - Language, image, and multimodal models
  - Market applications and products
  - Example: Google Gemini
- Issues and risks:
  - Ethics and bias
  - Privacy and environmental impact
  - Risk of dystopian outcomes

Module 2: AI Demonstration

- Overview and Q&A session (1h30)
- DevOps and AI pipelines:
  - Data preprocessing
  - Training and optimization
  - Deployment
- Machine Learning in practice:
  - Demo with Scikit-Learn
  - User-friendly approach with PyCaret
  - Note: Source code via Google Colab
- Deep Learning in practice:
  - Demo with Numpy

        - Using PyTorch
        - Note: Source code via Google Colab
    - Generative AI:
        - Exploring large language and multimodal models
        - Fine-tuning and autonomous agents
        - Note: Hands-on in the next module with Google Gemini

Module 3: Using Google Gemini

- Hands-on experimentation with Google Colab (3h30)
- Using the chatbox:
    - Crafting simple prompts
    - Tips for Python and other technical prompts
- Using the Python API:
    - Designing advanced prompts
    - Code optimization and unit testing
- Using Gemini Studio:
    - Fine-tuning and Retrieval-Augmented Generation
    - Building an autonomous agent
    - Experimental projects with Python and more

Follow-up training with OpenAI

OpenAI Training for Developers

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